



# PLANT INTRODUCTION NEWSLETTER

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EXTERNAL RELATIONS

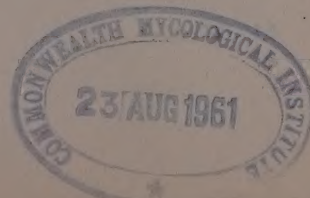
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## NOTES

1. These Newsletters represent informal communications addressed only to persons who are directly and actively interested in plant exploration, collection and introduction.
2. It is regretted that it is not possible to issue complete versions of these Newsletters in the three working languages of FAO - English, French and Spanish. As news items are, however, included in the original language the Newsletter is thus published in a trilingual form.
3. The earlier issues of this Newsletter contained reports of expeditions planned or in progress. It would be greatly appreciated if those concerned could send a report of these expeditions as soon as possible for inclusion in a later issue of the Newsletter.
4. All correspondence with regard to the above items should be addressed to the institutes or specialists concerned, or to: Dr. G. Julén, Plant Breeding Specialist, Crop Production and Improvement Branch, FAO, Rome, Italy. Those wishing to be included in the mailing list for further issues of these Newsletters are requested to inform the above if they have not already done so.

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165. FAO Technical Meeting on Plant Exploration and Introduction

In Newsletter item No.103, a report on the discussion on plant exploration and introduction which took place during the FAO Conference held in 1959 was given, and it was stated that a Technical Meeting on Plant Exploration and Introduction was planned for July 1961. It has now been decided that it will take place in FAO Headquarters, Rome, from 10 to 20 July 1961. This meeting will be the culmination of the Organization's work during recent years in promoting international collaboration in this important field of crop improvement and plant genetics.

All Member Governments of FAO have been invited to nominate delegates to attend this meeting, and copies of the agenda have been sent to various organizations and institutes in many countries. Additional information can be obtained from Dr. G. Julén, Plant Breeding Specialist, Crop Production and Improvement Branch, FAO, Rome, Italy, to whom all correspondence in connection with this meeting should be addressed.

The provisional Agenda for the meeting is as follows:-

Provisional Agenda

FAO action to date and Conference resolutions: A review of past achievements and recommendations by international and other conferences regarding possible future action will be given.

Current action and requirements with regard to specific major and minor crops:

Discussion on past and present activities and future needs with regard to individual crops, providing an essential basis for assessing the magnitude of the demand and extent to which action may be facilitated by international collaboration.

The genealogical basis of exploration and collection: Papers will be presented by specialists and fundamental aspects of this subject will be discussed, as well as the need to promote research in related fields, such as plant geography and climatology.

The conservation of natural vegetation (for wild species) and primitive cultivated forms in regions of greatest diversity:

The preservation of the primitive forms of cultivated plants and wild species in the natural vegetation should be considered, and recommendations made to prevent the destruction of sources of material.

The establishment of centres for exploration and preliminary introduction in regions of greatest diversity:

The Meeting should consider whether such centres could be established to serve as field bases for planning and co-ordinating collecting expeditions and for the cultivation and initial multiplication and screening of the collected material.



Botanical studies of natural flora in the field and at Botanic Gardens and Universities:

It is hoped that delegates from Botanic Gardens and Universities will speak about fundamental studies being undertaken and the maintenance of herbarium collections.

International collaboration in collecting expeditions, and International collaboration in the distribution of the proceeds of collections, and in their maintenance, study and utilization:

The possibility of establishing an international information service covering plant expeditions should be considered and the desirability of a regional grouping to deal with the limited stocks of material collected. The establishment of national plant collecting services with an international framework also needs to be considered.

Present organization and status of plant introduction services

Quarantine services in relation to plant introduction

Development of overall international collaboration on a global and/or regional basis:

Consideration of present functions and operations of international organizations concerned, and methods of obtaining continuity of collaboration in the future.

165. Réunion technique de la FAO sur la prospection et l'introduction des plantes

La rubrique No 103 de "Newsletter" donnait un aperçu des discussions qui avaient eu lieu sur la prospection végétale et l'introduction des plantes durant la Conférence de la FAO tenue en 1959, et il était annoncé qu'une réunion technique sur la prospection et l'introduction des plantes était prévue pour juillet 1961. Il a été décidé maintenant que cette réunion aurait lieu au Siège de la FAO, à Rome, du 10 au 20 juillet 1961. Elle représente l'aboutissement des travaux que l'Organisation a accomplis ces dernières années afin de promouvoir la collaboration internationale dans cet important domaine de l'amélioration des plantes cultivées et de la phytogénétique.

Tous les Etats Membres de la FAO ont été invités à envoyer des délégués à cette réunion et des exemplaires de l'ordre du jour ont été adressés à diverses organisations et institutions dans de nombreux pays. Des renseignements complémentaires peuvent être demandés à M. G. Julén, spécialiste de l'amélioration végétale, Sous-division de la production végétale et de l'amélioration des plantes, FAO, Rome, Italie, à qui doit être adressée toute la correspondance relative à cette réunion.

L'ordre du jour a été fixé provisoirement comme suit:



Ordre du jour provisoire

Action de la FAO jusqu'à ce jour et résolutions de la Conférence:

Un exposé sera fait sur les résultats qui ont pu être obtenus à ce jour, et sur les recommandations formulées par des conférences internationales ou autres au sujet des possibilités d'action future.

Mesures en cours et besoins futurs en ce qui concerne des plantes cultivées particulières d'importance majeure ou secondaire:

Examen des activités passées et présentes et des besoins futurs concernant des plantes cultivées considérées individuellement. Ces discussions fourniront une base indispensable pour déterminer quelle est l'ampleur des besoins et dans quelle mesure la collaboration internationale faciliterait l'action.

Bases génécologiques de la prospection et de la récolte des plantes:

Des spécialistes présenteront des communications à ce sujet et les aspects fondamentaux de cette question seront examinés, de même que la nécessité de promouvoir la recherche dans des domaines connexes tels que la phytogéographie et la climatologie.

Conservation de la végétation naturelle (pour les espèces sauvages) et des formes primitives cultivées dans les régions de plus grande diversité:

La préservation des formes primitives des plantes cultivées et des espèces sauvages de la végétation naturelle doit être étudiée et des recommandations doivent être formulées pour empêcher la destruction des sources de matériel végétal.

Etablissement de centres chargés de la prospection et des travaux préliminaires d'introduction des plantes dans les régions de plus grande diversité:

Les participants à la réunion doivent examiner s'il est possible de créer des centres de cette nature destinés à servir de bases pour l'organisation et la coordination des expéditions de récolte, ainsi que pour la culture et les opérations initiales de multiplication et de triage du matériel récolté.

Etudes botaniques de la flore naturelle sur la terrain ainsi que dans les jardins botaniques et les facultés de botanique:

On espère que les délégués représentant des jardins botaniques et des facultés de botanique donneront des renseignements sur les études fondamentales qui sont entreprises et sur les herbariums qui sont constitués.

Collaboration internationale en ce qui concerne les expéditions de récolte, et Collaboration internationale en ce qui concerne la distribution des plantes récoltées, ainsi que leur entretien, leur étude et leur utilisation:

Il convient d'étudier la possibilité de mettre sur pied un service international de renseignements sur les expéditions de récolte ainsi que sur l'opportunité de réaliser un groupement régional pour s'occuper des quantités limitées de matériel botanique récolté. Il faudrait également examiner la question de la constitution de services nationaux de récolte des plantes, dans le cadre d'un système international.



Organisation et statut actuels des services d'introduction des plantes

Les services de quarantaine dans leur rapport avec les services d'introduction des plantes

Organisation d'une collaboration internationale générale, sur une base globale et/ou régionale:

Rôle et fonctionnement actuel des organisations internationales intéressées et moyens d'assurer la continuité de la collaboration dans l'avenir.

165. Reunión Técnica de la FAO sobre Prospección e Introducción de Especies vegetales

En el Noticiero núm. 7, y como tema 103, se informaba acerca de las deliberaciones que se desarrollaron en la Conferencia de la FAO de 1959 sobre la prospección e introducción de especies vegetales, anunciándose que para julio de 1961 se preparaba una reunión técnica sobre la materia. Ahora se ha acordado que dicha reunión se celebre del 10 al 20 del citado mes, en las oficinas centrales de la FAO en Roma. Con esta reunión culminará la labor desarrollada por la Organización durante los últimos años en pro de una colaboración internacional en este importante sector del mejoramiento de cultivos y la fitogenética.

Todos los Estados Miembros han sido invitados a designar delegados para que asistan a esta reunión, y a organismos e instituciones de muchos países se ha remitido ya el programa provisional. Pueden solicitarse más detalles al Dr. G. Julén, especialista en Fitotecnica, Subdirección de Producción y Mejoramiento de Cultivos, FAO, Roma, a quien deberá dirigirse toda la correspondencia relacionada con esta reunión.

El programa provisional es como sigue:

Programa provisional

Acción desarrollada por la FAO hasta la fecha y resoluciones de la Conferencia:

Se presentará un examen de lo conseguido hasta el momento y de las recomendaciones formuladas en conferencias internacionales y de otro carácter respecto a una posible acción futura.

Actividades actuales y necesidades futuras en cuanto a determinados cultivos principales y secundarios:

Debates acerca de las actividades pasadas y actuales y sobre las requeridas en lo futuro para cada cultivo por separado, lo que servirá de base esencial para determinar la magnitud de la necesidad de acción y la medida en que ésta puede ser facilitada por la colaboración internacional.

Fundamentos genecológicos de la prospección y recogida de especies:

Se presentarán documentos preparados por especialistas y se discutirán los aspectos fundamentales de la materia y la necesidad de promover investigaciones en campos afines tales como la fitogeografía y la climatología.



La conservación de la vegetación natural (especies silvestres) y las formas primigenias cultivadas en las regiones de mayor diversidad:

Se considerará la conservación de formas primigenias de plantas cultivadas y especies silvestres en la vegetación natural, formulándose recomendaciones para evitar la destrucción de los recursos de material fitotécnico.

Establecimiento de centros de prospección e introducción preliminar en las susodichas regiones:

La reunión deberá considerar la posibilidad de establecer tales centros para que sirvan de base de operaciones para la planificación y coordinación de expediciones para la recogida de especies, y para cultivo, multiplicación inicial y selección de las plantas recogidas.

Estudios botánicos de la flora natural en el campo, en jardines botánicos y universidades:

Se espera que los representantes de jardines botánicos y universidades hablen de los estudios fundamentales en marcha y del mantenimiento de colecciones de herbarios.

Colaboración internacional en las expediciones para la recogida de especies, y

Colaboración internacional en la distribución del material recogido y en el mantenimiento, estudio y utilización de las colecciones:

Debe estudiarse la posibilidad de establecer un servicio internacional de información sobre las expediciones y la conveniencia de constituir grupos regionales que tengan a su cargo limitadas cantidades del material recogido. Habrá que considerar también el establecimiento de servicios nacionales de recogida encuadrados en un marco internacional.

Organización y situación actual de los servicios de introducción de especies

Servicios de cuarentena en relación con la introducción de especies

Fomento de la colaboración internacional en el plano mundial y en el regional:

Consideración de las funciones y operaciones actuales de los organismos internacionales pertinentes y procedimientos para conseguir una colaboración ininterrumpida en lo futuro.



166. The Organisation of the Investigation and Introduction of  
plants of the natural flora in the Botanic Gardens of  
the U.S.S.R.

Prof. M.V. Kultiasov  
Central Botanic Garden, U.S.S.R. Academy of Sciences,  
Moscow, U.S.S.R.

In the U.S.S.R. there are more than 80 botanic gardens, situated in different climatic regions: from the arctic area (the Polar-Alpine Botanical Garden in Hibini) to the sub-tropics (in the Crimea: the Nikitsky Botanic Garden of the Academy of Sciences of the Ukrainian S.S.R. near Jalta; in the Caucasus: the Ierevan Botanic Garden of the Academy of Sciences of the Armenian S.S.R.; the Batumi, Suhumi, Tbilisi Botanic Gardens of the Academy of Sciences of the Georgian S.S.R.; the Baku Botanic Garden of the Academy of Sciences of the Azerbaijan S.S.R. and others); from the coast of the Pacific Ocean (the botanical garden in Vladivostok) to the Baltic Sea coast (the botanic gardens of the Baltic republics); from the high mountains of the Pamiro-Alai, Tian-Shan, Caucasus (the Pamir Botanic Garden in Khorog at the height of 2,300 m., mountain station botanic gardens of the Caucasus and Central Asian republics) to the hot deserts and semi-deserts of central Asia and Kazakhstan (the botanic garden of the Academy of Sciences of the Kazakh S.S.R. in Karaganda); the botanic garden of the Academy of Sciences of the Uzbek S.S.R. in Tashkent; the botanic garden of the Academy of Sciences of the Turkmen S.S.R. in Ashkhabad).

There are also botanical gardens in the forest and steppe zone with the continental climate of Siberia and the European part of the U.S.S.R.

The location of the gardens of the U.S.S.R. in different climatic regions makes it possible to carry out broad investigations of the main problem of research of botanical gardens, i.e., the introduction and acclimatization of plants of the natural flora of the U.S.S.R., the cultivated flora of the U.S.S.R., and the exotic flora with the aim of enriching with new and useful plants.

With respect to organization and methods, the botanical gardens are united through the Council of Botanical Gardens of the U.S.S.R., attached to the main botanical garden of the Academy of Sciences in Moscow. Academician N.V. Tsitsin of the Academy of Sciences of U.S.S.R. is the Chairman of the Council of Botanical Gardens. The author of this article is the Chairman of the Permanent Commission of Introduction and Acclimatization of Plants of the Council of Botanical Gardens.

The Permanent Commission fulfils the following tasks: planning, coordination of research work of the botanical gardens on the introduction and acclimatization of plants, the organizing of conferences on theoretical, methodical and practical questions of introduction, presentation of co-ordinated plans for the consideration and confirmation of the Council of Botanical Gardens of the U.S.S.R.



During a conference of the Commission on plant introduction from 15 to 18 March 1960, the Chairman (author of this article) made a report on "The main tasks of the seven-year plan of research work on plant introduction of the botanical gardens of the U.S.S.R."

According to the decisions adopted, it was agreed that the botanical gardens will develop their work along the following lines:-

1. The summarizing and collating of experience of plant introduction in the U.S.S.R. in various groups of useful plants.
2. A wider introduction of valuable plants of native and exotic floras, especially the development of funds for plant collection.
3. The working out of the theory and methods of introduction and acclimatization of plants, and methods of active influence on plants introduced, with the aim of raising their productivity.
4. The development of enquiry and common herbarium of introduced plants.

Ten botanical gardens of the U.S.S.R. have been organized on a zonal basis in which the same species of plants to be introduced are tried out according to a unified system. This system of zonal botanical gardens makes it possible to make a quicker estimation of the practical value of the plants and to determine in which zones these plants will show the highest productivity. The task of the zonal botanical gardens includes the organization and co-ordination of the plans of work of the other botanical gardens within the same zone. The zonal gardens maintain a direct organizational and scientific connection with the Permanent Commission for plant introduction and, through it, with the Council of Botanical Gardens of the U.S.S.R.

Collections of many species of the different regional floras of the U.S.S.R. are concentrated in the botanical gardens, such as species of the Far East, Siberia, Central Asia, Kazakhstan, the Caucasus and the Crimea and the European part of the U.S.S.R. There are also collections of exotic floras, especially trees and bushes and some specialized collections of wild useful plants and decorative plants. The richest collections are in the Polar-Alpine Botanical Garden of the Academy of Sciences of the U.S.S.R. in Hibini, the Central Siberian Botanical Garden of the Academy of Sciences of the U.S.S.R. in Novosibirsk, the Tashkent Botanic Garden of the Academy of Sciences of the Uzbek S.S.R., the Stalinabad Botanic Garden of the Academy of Sciences of the Tadjik S.S.R., the Pamir Botanic Garden of the Academy of Sciences of the Tadjik S.S.R., the Erevan Botanic Garden of the Academy of Sciences of the Armenian S.S.R., the Tbilisi Botanic Garden of the Academy of Sciences of the Georgian S.S.R., the Nikitski Botanical Garden of the Academy of Sciences of the Ukrainian S.S.R. (Crimea, Jalta), the Kiev Botanic Garden of the Academy of Sciences of the Ukrainian S.S.R. and others.

Valuable collections of flora of the U.S.S.R. are concentrated in the main botanical garden of the Academy of Sciences of the U.S.S.R. in Moscow. From the total of some 18,000 plant species of the U.S.S.R., almost 4,000 species are in the collections of the main botanical garden



of the Academy of Sciences. The flora of the Far East is especially well represented; about 900 of the most valuable and interesting species of flora of the Far East (which has in total 2,500 species) are represented in the collections of the main botanical garden. The collections of the botanical gardens are replenished yearly by special expeditions. These collections provide the initial material for work on the introduction and acclimatization of useful native plants, which are valuable as foodstuffs, fodder, industrial and decorative plants. These collections also provide material for theoretical studies in plant introduction, and also for the transformation of plants by hybridization. Work on introduction, acclimatization and transformation of plants by hybridization is certainly very difficult, but the results affirm the need for their development. Outstanding success has been achieved by the method of remote hybridization used by Academician N.V. Tsitsin of the Academy of Sciences of the U.S.S.R., involving the crossing of cultivated plants with wild species, in particular wheat with Agropyron spp. Valuable varieties have been obtained which are now widely sown on the fields of the collective farms of the U.S.S.R. These studies on remote hybridization also serve as valuable material for the theory of species formation.

The theoretical basis of the introduction and acclimatization of native plants is only to a certain degree common with the theoretical precondition of the introduction of cultivated plants. The theory of introduction and acclimatization as a whole, concerning both cultivated and native plants, was developed by the investigations of I.V. Mitchurin, Honorary Academician of the Academy of Sciences of the U.S.S.R. The botanical gardens of the U.S.S.R., proceeding from theoretical positions fixed by I.V. Mitchurin, are promoting the development of theory and practice of the introduction and acclimatization of natural plants.

According to I.V. Mitchurin the peculiar adaptations of an organism, its hereditary basis, are formed in the process of historical development in close connection with variable conditions of the environment. This concept has provided a solution to many problems of plant introduction. On the basis of the historical laws of the development of floras and the adaptation properties of the individual species, the objective is to estimate the potential possibilities of growth and the development of the plants which are to be introduced in the ecological conditions of a given region.

The experience of introduction in the main botanical garden with about 4,000 species of herbaceous plants, trees and shrubs of the flora of the U.S.S.R. shows that the possibility of introduction is not defined by modern physico-geographical and ecological natural conditions, but to a large and decisive degree by the peculiarities of the ecologo-historical development of a species. This has made it possible to suggest the ecologo-historical method of introduction of plants of the natural flora, a method which, with its theoretical basis is now being adopted in several botanical gardens.

As a result of the analysis of the ecologo-historical ways of development of the mountain arboreal flora of Central Asia, it is concluded that the main and decisive change in its composition and the character of the formation took place in the glacial period. In the period of holocene, the flora was subjected to further changes, and the result was the modification of the mesophytic nature of the trees



and shrubs of the mountain ranges of Central Asia under these new conditions. Under the influence of drought, the nature of the mesophyte was changed and took on the features of a xerophyte. The ability to adapt became more pronounced. The tree and shrub flora of Central Asia serves as an inexhaustible natural reservoir for introduction to the mesophytic zone, as has been confirmed in practice. A.M. Osol proved by numerous experiments that it is possible to grow walnuts near Moscow, and that the best results can be achieved by using nuts received from Central Asia. Other species of different genera of trees and shrubs from flora of Central Asia have been successfully introduced in the wood and forest-and-steppe regions of Eurasia.

In considering the theoretical basis for the introduction of plants of a native flora, it is necessary probably to base it on the statement that development appears as a result of the interaction of plants with their environment through adaptations leading to the assimilation of elements as foodstuffs from that environment, and through protective adaptations stimulating the life processes.

In the process of historical development only those acquired characters are retained which have some advantage for the vital activity of an organism, i.e. there is a certain tendency to the historical development of organisms. This takes place because plants form adaptations and reactions, both protective and constructive, as a result of which the ability of a plant to produce is intensified under given oecological conditions. The plant itself is re-formed. This is the basis for historical development, i.e. the appearance of reactions of primary importance and their fixation in the generations. By changing or replacing living conditions by separating the vegetation located at a given area, it will adapt itself in varying degrees to both protective and creative functions. They might to some extent lose the acquired advantages in the productive ability by which they were distinguished under former conditions. For example, plants formed historically as mesophytes under xerophytic conditions begin to re-form, and to show protective adaptations. Accordingly, the productive ability is likewise changed. Under new xerophytic conditions, the creative functions reveal themselves with less results than under the mesophytic conditions and show a lower productivity. But plants may considerably raise their productivity under other, changed conditions. Experiments have shown that, when plants of a xero-mesophytic nature are placed under mesophytic conditions, their productivity is intensified and this ability becomes stronger in the following generations. The Central Asian plants which are mostly of mesophytic origin, when placed under arid conditions, show characters of the xerophytes which can be traced in their structure and functions. Such plants may be called xero-mesophytes because of their dual nature. When plants of a xerophytic nature are placed under mesophytic conditions, they reveal an ability to higher productivity which develops quickly from one generation to another, as has been proved by wide experience of plant introduction from the flora of arid Central Asia in the main botanical gardens of the Academy of Sciences of the U.S.S.R. in Moscow.

Thus, thanks to the ecologo-historical analysis we can reveal the hereditary nature and adaptive qualities of a plant and on this basis define the ways and methods for its introduction, and also the natural regions and conditions in which it will be able to show a higher productivity.



The work of the botanical gardens of the U.S.S.R. on the introduction and acclimatization of wild species reveals wide possibilities for international co-operation with foreign botanical gardens, scientific institutions and scientists interested in this problem.

(Fuller details may be found in the following:

Bulletin No.37 of the Central Botanic Garden of the U.S.S.R.  
Academy of Sciences, Moscow, 1960, pp.13-19)

167. Introduction et échanges de plantes entre les pays de la zone  
inter-tropicale

(Référence: Article de M. Guy Perrin de Brichambaut, Rubrique No 99,  
Plant Introduction Newsletter No.7, avril 1960)

H. Barat  
Secrétaire Scientifique  
Commission Phytosanitaire Interafricaine\*

Le développement économique de l'Afrique, qui reposera essentiellement dans ses débuts sur un développement de sa production agricole, ne peut évidemment se faire sans de nombreuses introductions de plantes.

Il importe toutefois de noter que toute introduction de plante n'est pas forcément en soi une bonne chose. Ces introductions comportent des dangers que la Commission Phytosanitaire Interafricaine étudie depuis cinq ans. Cette Commission a établi toute une série de recommandations qui forment la substance d'un système complet de mesures législatives dont nous nous efforçons de promouvoir l'application dans tous les pays de l'Afrique au Sud du Sahara (Législation coordonnée, Document I.A.P.S.C. 159/22). Il a été reconnu en particulier qu'un grand nombre de plantes ne pouvaient être introduites qu'après une culture en quarantaine. Contre certaines maladies particulièrement dangereuses, il a même été prévu une double quarantaine comportant une première épreuve dans un pays non contaminé mais hors d'Afrique, et une seconde épreuve en Afrique dans une station spécialement équipée à cet effet.

Les conditions d'une quarantaine efficace ont été définies avec beaucoup de soin notamment par les Drs. H.H. Storey et F.M.L. Sheffield\*\*. La sécurité repose essentiellement sur une surveillance sanitaire très sérieuse et très compétente, durant une période de végétation de durée variable (2 ans environ pour la canne à sucre), et aussi sur les conditions matérielles d'isolation. Il en résulte qu'une station de quarantaine convenable ne peut être organisée que dans un centre de recherches agronomiques très important, groupant plusieurs phytopathologistes, plusieurs entomologistes, et au moins un nématologue. Les installations matérielles comportent des serres d'isolation spécialement étudiées avec humidité atmosphérique réglable, température contrôlable par ventilation, et un éclairage réglable.

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\* c/o Commonwealth Institute of Entomology, 56 Queen's Gate, London S.W.7, England.

\*\* Rapport présenté à la réunion d'experts de la Commission Phytosanitaire Interafricaine tenue à Nairobi, avril 1958, et FAO Plant Protection Bulletin VI, 7, pp.149-152, 1958.



Ne sont approuvées par la Commission Phytosanitaire Interafricaine, pour l'application des mesures législatives prévues par la Convention Phytosanitaire Interafricaine, que les stations de Muguga (East African Agriculture and Forestry Research Organisation), de Stellenbosch (Union Sud-Africaine), d'Ibadan (Service Fédéral de la Recherche Agronomique, Nigeria), et d'Antananarivo (Institut de Recherches Agronomiques de Madagascar), et, hors d'Afrique, les stations de Beltsville (U.S.A.), Kew (Royaume-Uni), Paris (France), et Lisbonne (Portugal). Les stations Africaines, insuffisantes en nombre, ont aussi une surface insuffisante de serres et leur personnel technique est surchargé. En effet l'élimination des maladies en quarantaine a cessé d'être le résultat d'une simple observation passive: autrefois on se contentait d'attendre la manifestation de symptômes morbides sur les plantes en observation; des virus, des anguillules, et même des bactéries ou des champignons pouvaient être présents, si des symptômes n'apparaissaient pas, cette présence demeurerait ignorée; au bout d'un certain temps, la plante était admise à sortir de quarantaine. Aujourd'hui des techniques variées s'appliquent à la détection des viroses (greffage, sérologie) et d'autres à la détection des nématodes. La recherche des formes latentes d'infection par les bactéries et les champignons est souvent entreprise, mais ne comporte sans doute pas des méthodes aussi sûres que celle de la virologie. Chaque introduction s'accompagne ainsi d'une foule d'opérations mettant en jeu plusieurs laboratoires de spécialités différentes. L'introduction des plantes est devenue une science complexe, surtout lorsqu'il s'agit de matériel végétatif. Cette introduction ne peut se faire à grand débit sans présenter des dangers considérables, au moins pour nombre de plantes cultivées.

On peut se demander, en ce qui concerne l'Afrique, s'il est vraiment raisonnable de pousser à introduire systématiquement des plantes nouvelles quand les services chargés des recherches agronomiques ont, dans la plupart des pays, un personnel technique tellement insuffisant en nombre qu'ils sont souvent hors d'état d'entreprendre une expérimentation valable pour utiliser les variétés déjà introduites et sont parfois obligés d'abandonner des travaux en cours? Tant que dureront de telles conditions, l'introduction de plantes, et plus spécialement de matériel végétatif, doit être au contraire déconseillée comme inutile et même potentiellement nuisible.

Nous pensons pourtant qu'il faut appuyer la suggestion de M. Perrin de Bricambaut de choisir "quelques centres régionaux parmi les plus caractéristiques dans chacune des principales régions écologiques ...". Mais il faut concevoir ces centres comme dotés d'un personnel scientifique extrêmement important de phytopathologistes (virologues, mycologues, et bactériologistes) d'entomologistes de diverses spécialités et de nématologues, avec bien entendu les moyens matériels, correspondant au programme conçu. Ces centres joueront alors un rôle considérable, non seulement par l'apport de matériel végétal étranger, mais plus encore peut-être par la création de variétés sur place et par l'apport de techniques culturales nouvelles adaptées au milieu. Comme actuellement de tels centres n'existent pas en dehors de ceux que nous avons déjà cités en Afrique Orientale, en Afrique du Sud et au Nigeria, le premier travail à entreprendre est d'en créer le nombre nécessaire. Cependant à partir de certains centres de recherche agronomique déjà existants, on pourrait établir, en les développant, le réseau de centres régionaux et nationaux qui a été suggéré. En ce qui concerne le continent Africain, une collaboration étroite entre la FAO et la CCTA est désirable pour



promouvoir un programme réaliste harmonisé avec les projets nationaux ou régionaux de mise en valeur déjà étudiés ou même en cours de réalisation.

C'est probablement dans un tel domaine qu'est ouvert le champ le plus vaste et le plus efficace à la coopération technique internationale. Tant que de telles institutions leur feront défaut, les nations Africaines ne pourront pas être maîtresses du développement de leur production agricole et l'on verra s'accroître l'écart entre les conditions de vie dans les pays déjà équipés d'organisations scientifiques suffisantes et les pays non équipés qui resteront à jamais incapables de s'équiper.

167. The Introduction and exchange of plant material between countries of the inter-tropical zone

(With reference to the article by Mr. G. Perrin de Brichambaut, Item No. 99, Plant Introduction Newsletter No.7, April 1960)

H. Barat  
Scientific Secretary  
Inter-African Phyto-Sanitary Commission\*

The economic development of Africa, which will initially mainly concern the development of her agricultural production, can obviously not be carried out without entailing numerous introductions of plants.

It should, however, be noted that the introduction of a plant is not in itself always a good thing. These introductions involve dangers which the Inter-African Phytosanitary Commission has been studying for the past five years. This Commission has drawn up a series of recommendations forming the substance of a complete system of legislative measures whose application the Commission has tried to encourage in all the countries of Africa South of the Sahara (Co-ordinated Legislation, Document I.A.P.S.C.(59)22). It was recognised, in particular, that a great number of plants could not be introduced without previous cultivation in quarantine. With regard to certain particularly dangerous diseases, double quarantine comprising a first period of quarantine in a non-infested country outside Africa and a second period in a specially equipped station within Africa has been advocated.

The conditions for effective quarantine have been defined in detail by Dr. H.H. Storey and Dr. F.M.L. Sheffield.\*\* Safety depends essentially on thorough and competent sanitary supervision during a period of growth of variable duration (approximately 2 years for sugar-cane), and also on the material conditions of isolation. As a result, a suitable quarantine station can only be organised in an important centre for agricultural research comprising several plant pathologists, several entomologists, and at least one nematologist. The material installations include specially adapted isolation glasshouses with adjustable atmospheric humidity, temperature controlled by ventilation, and adjustable shading.

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\* c/o Commonwealth Institute of Entomology, 56 Queen's Gate, London S.W.7, England.

\*\* Report presented at the Meeting of Experts convened by I.A.P.S.C. at Nairobi in April 1958. FAO Plant Protection Bulletin VI, 7, pp.149-152, 1958.



Only the following stations have been approved by the Inter-African Phytosanitary Commission for the application of the legislative measures covered by the Inter-African Phytosanitary Convention:- Muguga (East African Agriculture and Forestry Research Organisation), Stellenbosch (Union of South Africa), Ibadan (Federal Department of Agricultural Research, Nigeria), and Ambatobe (Institut de Recherches Agronomiques, Madagascar), and, outside Africa, Beltsville (U.S.A.), Kew (U.K.), Paris (France) and Lisbon (Portugal). The African stations, insufficient in number, also have insufficient room for glasshouses and their technical staff is overworked. In fact, the elimination of diseases in quarantine has ceased to be the result of passive observation; formerly one simply awaited the appearance of morbid symptoms on the plants under observation; viruses, eel-worms, and even bacteria or fungi might be present, but if the symptoms did not appear, their presence remained unknown; after a certain time, the plant was released from quarantine. Today, a variety of techniques are employed to detect viruses (grafting, serology) and others to detect nematodes. A search for latent forms of infection by bacteria or fungi is often undertaken, but doubtless does not comprise such sure methods as those for viruses. Each introduction thus entails a host of operations involving several laboratories of various specialities. The introduction of plants has become a complex science, particularly in regard to vegetative material. Such introductions cannot be carried out on a large scale without incurring considerable danger, at least for a number of cultivated plants.

With regard to Africa, consideration should be given to whether it is wise to encourage the systematic introduction of new plants when the services entrusted with agricultural research are, in most countries, suffering from such a great shortage of technical staff that they are often unable to carry out reliable experiments to use the varieties already introduced and are sometimes obliged to abandon a part of the work in progress. So long as such conditions last, the introduction of plants, and especially of vegetative material, should on the contrary be discouraged as being useless and even potentially dangerous.

However, the suggestion made by Mr. Perrin de Brichambaut to choose "some regional centres amongst the most characteristic in each of the principal ecological regions ..." should be supported. But it should be realised that these centres must possess an extremely large scientific staff consisting of plant pathologists (virologists, mycologists and bacteriologists), of entomologists of various specialities and of nematologists, with, of course, the material means corresponding to the proposed programme. These centres will then play a considerable rôle, not only by supplying foreign plant material, but even more perhaps by the creation of varieties on the spot and by furnishing more modern agricultural methods adapted to the environment. As at the present time such centres do not exist, except those already mentioned in East Africa, South Africa and Nigeria, the first job to be undertaken is to establish the necessary number of centres. By developing certain agricultural research centres already existing, the suggested network of regional and national centres could be organised. Insofar as the African continent is concerned, close collaboration between FAO and CCTA is desirable in order to promote a realistic programme in harmony with the national and regional development plans already studied or even in progress.



It is probably in this field that international technical co-operation can be put to the greatest and most effective use. So long as they lack these institutions, the African nations will not be able to control the development on their agricultural production and the gap will widen between the standard of living in the countries already equipped with sufficient scientific organisations and the countries which are not thus equipped, which will remain forever incapable of equipping themselves.

168. UNESCO Symposium on the Impact of Man on Humid Tropics Vegetation

A Symposium on the Impact of Man on Humid Tropics Vegetation was held at Goroka, Eastern Highlands of Australian New Guinea, during September 14-20, 1960, followed by field-trips during five days. It was sponsored by the Administration of Papua and New Guinea of the Australian Government and the UNESCO Science Co-operation Office for Southeast Asia. It was the third UNESCO Symposium devoted to the Humid Tropics Vegetation sponsored by this Science Co-operation Office. The first Symposium was held at Kandy, Ceylon, during March 19-21, 1956. The second Symposium on Humid Tropics Vegetation was convened at Bogor, Indonesia, during December 12-15, 1958.

The following countries were represented: Australia, India, Indonesia, Malaya, Philippines, Sarawak, Singapore, Territory of Papua and New Guinea, Thailand, United Kingdom and United States. The South Pacific Commission was also represented, and representatives of the native population of New Guinea were present as observers.

It is the intention of the UNESCO Science Co-operation Office for Southeast Asia to publish the proceedings of the Symposium, including reports and an account of the discussions. Enquiries should be addressed to: Djl. Diponegoro 76, P.O. Box 2313, Djakarta, Indonesia.

SUMMARY

by  
Prof. H.B. Gilliland\*

Dr. Gunther in his opening remarks referred both to Man and to trees; Man in New Guinea living in a blind alley of Human culture; trees struggling in intense competition. He paid homage to that great Naturalist Charles Darwin and in so doing launched this Symposium upon its way.

It had been our intention to have Prof. Wikkramatileke deliver an opening address in which as a Geographer he would outline the physical background to our discussions. Unhappily, Fate intervened and Prof. Wikkramatileke is now in hospital recovering from a major operation. To deal with this emergency Prof. Blaut, Dr. Fosberg and Dr. Corner gallantly came forward and by improvising surveys of Climate, Soils and Geology and Vegetation provided this background.

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\* Prof. H.B. Gilliland, Professor of Botany and Dean of the Faculty of Sciences of the University of Malaya in Singapore.



Prof. Blaut, on climatology, reviewed the work of Köppen, Holdridge, Thornthwaite and Garnier and touched lightly on numerical values for climatic factors. He stressed the importance of day-length in the Tropics and the need for contact with reality when defining humid zones, instancing the case of Aden. Special climatic qualification is often necessary as for instance with Goroka in the highlands, where altitude alters, e.g. temperature.

Dr. Fosberg, in reviewing tropical soils and geology noted that weathering and leaching were faster and organic decomposition more rapid in the humid tropics. Organic matter did not seem to become incorporated in the soil to the same extent and differences in parent material appeared to be more important, while "old" soils were rare; The only rock peculiar to the tropics was coral limestone; the process of leaching was a process in the tropics whereby silica was removed leading to laterisation: laterite and lateritic soils.

Dr. Corner, reflecting upon the peculiarities of the vegetation, drew attention to the curious phenology of the plants living in the non-seasonal tropics: clearly Man could not have developed a "calendar" here. But we also have to include the seasonal monsoon areas. He drew attention to the edibility and putrescibility of the tropical forests and not only to the large numbers of organisms but also to the extraordinarily large number of species.

This great number of species has been unchallenged and your reviewer suggests that this leads to the proposition that in the humid tropics competition of a non-Darwinian kind obtains. "Survival of the fittest" seems to have curiously inadequate meaning in this particular context.

Prof. Geddes next came forward to review the Human Background and in the course of a stimulating review gave us as a guiding principle,

"Man cannot live like the beasts and survive".

He stressed the great homogeneity of opinion among primitive peoples and their natural conservatism. He made it plain that any attempt to change the mode of living of a primitive people should first foster a desire for such change.

Our first specific field of discussion after the opening addresses was on the effect of selection and cultivation of foods by Early Man on the Vegetation of the Humid Tropics.

Dr. Barrau presented the review paper and drew attention to the way the use of a plant could survive in ritual observances. His purpose appeared to be to show how, especially when a taboo process was used, a species exploited by early man would not be exterminated, but would rather be preserved in such a way as to lead insensibly to its cultivation.



Dr. Fosberg, dealing with the coconut, suggested that persistent selection and cultivation, coupled with a pleistocene rise in sea level, could have brought about a substitution of the cultivated for the wild form.

To quote "Vast areas of lowland tropical vegetation have been replaced by coconut groves, even during prehistoric times". It is this last phrase which gives this significance, for in this modern technological age this has been repeated time after time, notably with rubber.

Dr. Quisumbing drew our attention to some wild species used as emergency foodstuffs in the Philippines during the war.

Mr. Keleny showed that virtually all the basic food plants used in New Guinea today were introduced, while Dr. Meggitt dealt with the cultivated plants of the Enga people. Mr. Conroy in a very interesting paper reviewed agricultural practices, with special reference to its impact on forest and soil in New Guinea. In the subsequent discussion, Mr. Dilmy drew attention to several instances of plant seeds being deliberately dibbled into the soil in forests, and several others gave further instances.

Dr. Barrau, in summing up, noted that Man's principal effect on forest as a food gatherer was to multiply trees with edible fruits. Deliberate gardening had a far greater influence on vegetation.

The next session on Friday morning had for its theme "The Effect of fire used by Early Man on the Vegetation of the Humid Tropics".

Dr. Julius led the discussion with a paper in which he reviewed communal land ownership versus individual control in an endeavour to show how in the process of agriculture with the use of 3-20 year fallowing periods fire came to be used. The object was primarily to get rid of the debris by burning. In common with many other subsequent speakers, he drew attention to the "fun" the people got from burning, claiming that the hunting of game by burning was social rather than a serious food supplement.

A great deal of discussion ensued, from which certain points emerged. In the N.G. Highlands, the hunting rights are owned by a far larger group than garden rights hence firing for hunting is rarely a cause of dispute. That fires often start naturally is a view held by many and it was noted that some fires could be started maliciously in a spirit of revenge.

This was followed by a paper by Mr. McIntosh on "The effect of Man on the Forests of the Highlands of Eastern New Guinea".

He submitted that in the view of the Indigene "Forest was of nuisance value" and its reduction to grass by agriculture and maintenance as grass by fire represented a continuing process accelerated by the introduction of sawmills. Replanting is now encouraged and the working of forest areas on a sustained yield basis has become the objective.



A good many contradictory reports were made and views expressed. Mr. Dilmy dealt briefly with his paper on "The effect of Fire used by Early Man" from which I would highlight his appeal for Nature Reserves deliberately to be set aside and protected both from fire and disturbances of other sort. Discussion with claim and counter-claim notably concerning Imperata continued. The truth of the old adage "Fire is a bad master but a good servant" is seen once again. In summing up Dr. Meggitt noted:- in all cases the long-term effects of the use of fire are profound. It is right to say that in the view of this Symposium specific experimentation in this matter is required by S.E. Asia.

The afternoon session was devoted to the discussion of the effects of grazing by the domestic animals of Early Man on the Vegetation of the Humid Tropics. The leading paper was presented by Dr. Bryan, who submitted that the first domestic animals were not kept for food. Tropical grasslands are Man-made communities and undergrazing was more dangerous - in terms of reversion to scrub - in the tropics. Hence his claim that hard grazing is the only substitute for fire.

Dr. Bryan drew attention to the search for a legume to integrate into tropical pastures and noted the invasion of Desmodium into cut Imperata in the Lae District. In discussing the pig, which features so largely in New Guinea, Mr. Aitchison noted that in the wild state it is primarily a forest dweller. He alone mentioned the effect of feral pig on forest, stating that through their effect on fruit and seed they cause the forest areas to become sparsely timbered.

Dr. Fosberg, in dealing with Oceanic islands, remarked that deliberate policy had introduced grazing animals such as goats in very many cases. He instanced the well-known example of the island of St. Helena, where no native trees now exist and where several unique tree members of the Compositae have become extinct. Dr. Robbins presented Mr. J. Anderson's paper in which the total lack of grazing animals in New Guinea prior to the European advent was noted. Problems related to the introduction of grazing animals were discussed and the fact that sheep - due to intestinal parasites - were quite unsuccessful was noted. In the subsequent discussion Dr. Bryan raised the whole question of whether the introduction of grazing animals is advisable at all. He proffered the view that "waste grasslands" should first be carefully studied with the object of providing feed at an adequate level for introduced grazing stock. In the course of much further discussion the use of grazing animals to break up non-thorny thicket was noted. Dr. Bryan summed up the discussion and suggested that the symposium resolve:-

1. That the further introduction of animals be prevented.
2. That basic studies of the fertility status of grasslands be carried out.
3. That more intensive studies of grassland ecology are needed.
4. That more intensive studies of derived communities be carried out.
5. That the social and religious implications of the introduction of grazing animals be considered.
6. That organic matter in tropical soils requires further study.



Our next day was devoted to the study of "The effects of shifting cultivation on the vegetation of the Humid Tropics" and as this had followed the very interesting and illuminating excursion of the weekend the symposium tackled the matter with gusto.

Dr. Blaut delivered the leading address which he entitled "The Nature and effects of shifting agriculture" and introduced from Pelzer the working definition as follows:-

"rotation of fields rather than crops; cleaning by means of fire; absence of draught animals and of manuring; use of human labour only; employment of the dibble stick".

Under the conditions obtaining there was no reason why an equilibrium should not be achieved especially as careful control of fire appeared not only possible but usual. Population pressures did not inevitably alter this picture, for to some extent there was a partial substitutability of labour and land. After this cushioning effect was passed, however, population pressure must lead to unbalance.

One of the effects of shifting cultivation could be the exhaustion of the seed source for the return of the original vegetation and furthermore a fundamental change in the soil could be brought about.

Shifting cultivation was essentially a response to population growth and technological advance may in its turn lead to the abandonment of shifting agriculture.

In discussion Mr. J.A.R. Anderson reported that the conditions in Sarawak conformed to Pelzer's definition and then outlined an experimental programme which was being undertaken to study its effects. In relation to aboriginal peoples in Malaya, Dr. Carey reported that shifting cultivation must be accepted until pressure on land develops. Dr. Quisumbing reported that in his experience the area affected by shifting cultivation in the Philippines had increased.

Mr. Kingston, in the course of an interesting paper, showed that in local New Guinea conditions the downslope drains of the Sweet Potato gardens may well be soil conserving by preventing waterlogging and landslides. In discussion it emerged that the use of Casuarina as in New Guinea was quite unique and that its seeds were actually harvested and sown.

Summarizing this discussion, Prof. Poore noted points as follows:-

1. Experimental study of the secondary successions was highly desirable.
2. Study of man-induced v. natural landslips was required.
3. It would be unwise to disturb the existing Human pattern until more was known of these matters.
4. More research on the effects of forest destruction on climate and microclimate both on short-term and long-term basis was desirable.



Dr. Fosberg presented the leading paper for the next session which dealt with "The nature of the secondary communities resulting from the activities of Early Man and the methods of their detection". He noted that the instruments of Man's action were fire, grazing and the stone axe and claimed that the first effect was the change of the vegetation from a more mesophytic to a more xerophytic type. This was in strong contrast to the reaction of vegetation to small climatic changes which were normally absorbed. Thus savanna results from Man's action in the tropics. Vegetation came to correspond less and less with the habitat and more and more with the human pattern.

At this point Dr. Corner called the concept of a community in tropical vegetation in question and from the discussion resulting it became clear that monospecific dominance in a tropical community indicated disturbance, most probably human disturbance.

It is, I suppose, a rare Symposium which proceeds without some need for adjustment and accommodation. So it was on the final day. There was a substantial "carryover" from the previous day and the session was soon involved under the guidance of Mr. Havel in discussing afforestation as a means of containing and preserving the remaining catchment forests. He saw the grasslands as competitive to forests and as a great fire hazard. It was refreshing to listen to this positive approach.

Dr. Robbins followed with a massive review of the grasslands of New Guinea. He distinguished two principal types:

- a. Tall grassland which he regards as seral to forest, and
- b. Short grassland which he regards as a disclimax resulting from more prolonged interference. Both may be accompanied by fire-tolerant well spaced trees and shrubs. With the disclimax grasslands fire especially is the maintaining cause and in areas where "fire shadow" effect is found relict patches of forest may survive.

Prof. Poore read the paper by Dr. de Rosayro, which was the only paper to refer to climatic change in quaternary and recent times. With a much better documented prehistory and history in Ceylon than most other parts of S.E. Asia, he was able to point to forests - secondary forests - which have followed abandoned cities.

Dr. Fosberg reviewed the morning's discussion. He proposed the generalisation that "secondary communities are generally earlier successional stages than the communities displaced by Man"; deflection of succession is towards the xeric. Instancing the island of Guam, he was of the view that forest would return immediately if the original environment was restored.



In his final summary of the discussion on the nature of secondary communities, Dr. Robbins made the following points:

1. Changes in the vegetation are due to cultivation and their impact increases with increasing population pressure. In some places they are very evident, in others not so evident.
2. There is need to arrange for the utilization of grasslands which the present population does not use. In extreme cases a migration of peoples is advocated as the only possible measure.
3. The aim should be to control future events where this is possible.

The final session was diverted to some economic and social aspects of the effects of Early Man's action on the vegetation of the humid tropics. The most direct contribution to the subject under discussion was a paper by Dr. Polunin on the effect of shifting agriculture on human health and disease. Man's activities as a cultivator in the first place altered the pattern of disease-vector populations often to Man's own detriment but, when shifting cultivation is practised, the long-term build-up of parasite propagules is lessened and Man's insanitary habits rendered less dangerous. In the discussion much emphasis was laid on the attainment of a balance by the indigenous population with its environment prior to the beginnings of modernisation. This was being disturbed in a great variety of ways and a manifest desire for change on the part of Indigene was not the least powerful of the causes of the disturbance. Results directly attributable to the response of vegetation to Man's action were not easy to pin-point. That a reciprocal effect on humans did occur was the conclusion drawn in summarizing this session by Dr. Meggitt.

Following this summary a series of resolutions were proposed by Dr. Corner, who had co-ordinated the resolutions arising from time to time during the Symposium.

#### RESOLUTIONS

1. Considering the very great importance for the future of the countries of S.E. Asia and the islands of the Tropical Pacific of the secondary plant communities produced by human disturbance of the tropical forest, it is urged that UNESCO should promote research in all aspects of this subject
  - a. by appointing a consultant whose task would be:-
    - (i) to draw up a general programme of research to serve as a guide for comparative investigation;
    - (ii) to visit the countries of the region to stimulate and assist work along the lines of the programme;

- (iii) to ensure the overall co-ordination of the research;
  - (iv) to collate periodically the results and circulate summaries.
- b. by providing research grants where necessary.
- c. by providing annotated bibliographies of relevant literature as, for instance, on scientific investigations dealing with the effect of burning on soil and vegetation, and with the changes in soil-fertility consequent on the conversion of forest into grassland and other disclimax communities.
2. Considering the interest and importance of
- (i) understanding the relationships between Early Man and his plant environment,
  - (ii) recording the use of plants by primitive human communities before such information may be lost,
- it is requested that UNESCO
- A. should promote investigations in the field of ethnobotany in S.E. Asia and Tropical Oceania and, for this purpose, stimulate research designed to fill such gaps in the botanical knowledge of such tropical island groups as the Louisiades, New Hebrides, Santa Cruz, Wallis and Futuna, and the Marquesas;
  - B. should promote in the same region, closer collaboration in field-work between anthropologists and botanists, for instance by enabling a resident botanist to accompany anthropological field-work in a given country or vice versa;
  - C. should assist in the publication of the results of ethnobotanical research.
3. Considering the importance of:
- (i) recording now the effects of alien civilisation on primitive people before this transitional period is lost,
  - (ii) studying the early forms of animal husbandry,
- it is urgently recommended to UNESCO:
- A. to promote investigations into the psycho-sociological consequences of introduced pastoralism in primitive horticultural communities in the humid tropics, particularly in Oceania;



- B. to promote, by means of grants to appropriate universities or other research institutions, socio-economic investigations into the traditional animal husbandry of preliterate societies in S.E. Asia and Tropical Oceania.
4. Having regard to the great scientific importance of the original vegetation and of the soils of limestone formations in the Humid Tropics and to the extreme susceptibility of this vegetation to irreparable damage by fire and other causes, repeats the request made at the Humid Tropics Symposium in Indonesia (December, 1958) that UNESCO should promote investigations into this problem by making available funds sufficient for a preliminary survey of the limestone formations in this respect in S.E. Asia and Tropical Oceania, preparatory to the calling of a regional symposium on this subject and on the need for conservation of representative areas.
  5. After reviewing the effects of the impact of Man on the vegetation of the Humid Tropics, and after taking into consideration the increasing tempo with which the original landscape is being altered by human activities, this Symposium stresses the need to appreciate the scientific, aesthetic, and practical values of safeguarding examples of the original environment from irretrievable loss; requests UNESCO to stimulate effective programmes for the conservation of natural resources in the Humid Tropics by means both of nature reserves (for the indigenous fauna and flora, and for the representation of their varied and inter-dependent habitat-types) and of national parks (for scenic as well as faunistic and floristic ends); and emphasizes the importance of obtaining, through education and mass media, the appreciation and co-operation of the local population.
  6. Considering the importance of root-competition in Humid Tropics vegetation, recommends to UNESCO the promotion of investigations into ecological implications of root-physiology.
  7. Considering the importance of recording the relationship of primitive man to his environment in the very few remaining areas of S.E. Asia and Tropical Oceania where alien influence is only beginning, it is requested that UNESCO should promote research into the socio-economic adaptation of recently contacted groups, specifically by grants to appropriate institutions to assist with field expenses.
  8. Considering the great value of regional symposia on different aspects of the Humid Tropics, it is recommended to the UNESCO Science Co-operation Office for S.E. Asia to convene, within the next two years, a Symposium on Results of Recent Ecological Research in Humid Tropics.

(Extracted from UNESCO Humid Tropics Newsletter No.4, October 1960, obtainable from UNESCO Science Cooperation Office for Southeast Asia, Djl. Diponegoro 76, P.O. Box 2313, Jakarta, Indonesia).

169. FAO: Crop Production and Improvement Branch - Activities in seed exchange August 1960/February 1961

<u>Country and Date of Receipt of Requests</u>	<u>Seed Requested</u>	<u>Date Dealt with and Remarks</u>
Mr. W.H. Foster Regional Research Station, Samaru N. Nigeria 17/8/60	Seed of a range of ecotypes of <u>Andropogon</u> <u>gayanus</u> , <u>Pennisetum</u> <u>pedicellatum</u> and <u>P. subangustum</u>	Seed requested from Sudan, Uganda, Sierra Leone, Ghana, Kenya, India, and Senegal. 26/8/60 So far samples received and dispatched as follows: Kenya: <u>Andropogon gayanus</u> . Senegal: <u>Andropogon gayanus</u> and <u>Pennisetum pedicellatum</u> . Sierra Leone: <u>Pennisetum</u> <u>pedicellatum</u> and <u>P. subangustum</u> . India: <u>Pennisetum pedicellatum</u> .
Mr. E. McKee Moultrie Georgia, U.S.A. 23/8/60	Seed of <u>Trifolium</u> <u>vesiculosum</u>	Seed requested from University of Pisa, Italy. 30/8/60 Seed received and dispatched.
Dr. Abu Sharr FAO Agronomist Cyrenaica Libya 23/8/60	Seed of forage species: <u>Phalaris tuberosa</u> <u>Ehrharta calycina</u> <u>Oryzopsis miliaceae</u> <u>Bromus</u> spp. <u>Dactylis glomerata</u> <u>Melilotus alba</u> <u>Sanguisorba minor</u>	Seed of Mediterranean eco- types of species sent from Headquarters. 29/9/60
Mr. R. Majeed Agricultural Officer Gilgit W. Pakistan 25/8/60	Seed of maize wheat, rye and barley varieties suitable for growing at 6,000 ft.	Seed requested from Canada, USA, Turkey and Sweden. 27/8/60 So far following seed received and dispatched: <u>Canada</u> : Barley varieties Campana, Vantage and Husky. <u>USA</u> : 6 maize varieties from Iowa. <u>Turkey</u> : Barley variety Tokak and rye varieties Tuncely, Bringol, Erzurum-Patnos, Istanbul-Iuleburgaz, Ankara- Demeli and Diyarbakur-ram. <u>Sweden</u> : Rye varieties: Kings II, Varne, Double Steel and Petkus II.



Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
Mr. H.G. Keith FAO Representative in Libya Tripoli, Libya 25/8/60	1 Kilo seed samples of high yielding castor varieties for planting trials	Seed requested from Texas, USA 12/9/60 Seed of following varieties received and dispatched: Dawn, Baker 296, Baker Hybrid D1, Cimarron hybrid, Pacific hybrid 6, Baker 45 and Baker 48.
Mr. H. Douwes FAO Cotton Expert Manila Philippines 26/8/60	1 Kilo seed samples of the following cotton varieties: From <u>Pakistan</u> : 124 F, L 11, 199 F, AC 134, M 100, M 4 and SNR. From <u>India</u> : Punjab 268 F, Cambodia and a few other good commercial varieties. From <u>Indonesia</u> : Albar, UPA and UK strain.	Seed requested from cotton stations in countries concerned. 29/8/60 Seed already sent from the three countries direct to Philippines.
Professor R. Birecki Warsaw Poland 26/8/60	Seed samples of 80 wheat and barley stocks listed in the FAO Catalogues of Genetic Stocks.	Seed requested from all the countries concerned. 30/8/60 So far 50 samples received and dispatched.
Monsieur P. Jacquard Institut National de la Recherche Agronomique Versailles France 27/8/60	Seed of <u>Medicago sativa</u> FAO No. 8459.	No seed available. Seed requested from Iran. 30/8/60
Monsieur le Directeur Centre de Recherches Agronomiques Bambey Senegal 31/8/60	Two seed samples of sorghums with loose or open heads.	Seed requested from India. 1/9/60 Two samples received and sent.
Director of Agriculture Ministry of Agriculture Aden Protectorate 2/9/60	25 kilos of bitter almond seeds.	Seed requested from Israel, Tunisia and Italy. 4/9/60 15 kilos sent from Israel. 10 kilos each from Tunisia and Italy.

Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
Dr. J. Rajhathy Cereal Breeding Section Central Experimental Farm Ottawa Canada 1/9/60	Seed of following <u>Avena</u> spp.: <u>A. clauda</u> <u>A. pilosa</u> <u>A. longiglumis</u> <u>A. ventricosa</u>	Seed requested from Greece, Turkey, Libya, Syria, UAR and Israel. 13/9/60 As yet only seed of <u>A. longi-</u> <u>glumis</u> received.
Dr. Niekerk Division of Crops and Pastures Pretoria South Africa 6/9/60	Seed of a selection of ecotypes of <u>Trifolium</u> <u>repens</u> var. <u>latium</u> from Italy.	Seed requested in N. Italy. 12/9/60 2 samples received from Lodi; 1 sample from Bologna.
Dr. Bento Dias Ministry of Agriculture Vila Pery Mozambique 7/9/60	Wheat varieties suitable for growing at 600-700 m. altitude with 1000 mm. rainfall.	Seed requested from Kenya and Mexico. 19/9/60 So far 6 varieties sent direct from Kenya.
Mr. Maurice Amiot FAO Representative in Chile Santiago Chile 7/9/60	Seed of upland cotton ( <u>Gossypium hirsutum</u> ) varieties suitable for growing in irrigated valleys.	Seed requested from Greece and Morocco. 19/9/60 Following varieties received and dispatched: <u>Morocco</u> : 108 F, Texacala Lankhart and Northern Star. <u>Greece</u> : 16x08b, XD8B, 10E3a, 15E3b and 7E1a; all early maturing upland types.
Mr. Nazir Ahmed Pakistan Embassy Rome 8/9/60	Seed of <u>Aristida pennata</u> var. <u>Karellinii</u>	Seed requested from USSR. 8/9/60 Seed received and dispatched.
Mr. Semiti Department of Agriculture Dar-es-Salaam Tanganyika 10/9/60	Seed of <u>Vigna sinensis</u> from Nigeria; <u>Cajanus</u> <u>cajan</u> resistant to <u>Fusarium</u> from India; <u>Phaseolus angularis</u> from Japan and Surinam; <u>Cicer arietinum</u> from Greece and Egypt (UAR).	Seed requested from countries concerned. 15/9/60 So far two samples of <u>Cajanus</u> <u>cajan</u> received from India; 2 samples each of <u>Cicer</u> <u>arietinum</u> from Greece and Egypt (U.A.R.) and 2 samples of <u>Phaseolus angularis</u> from Surinam.



Seed of Pennisetum typhoides  
requested from India.  
21/9/60

Seed requested from Pakistan.  
10/10/60  
No seed received as yet.

Following material sent from  
Headquarters:  
Trifolium alexandrinum  
T. dubium  
T. hirtum  
T. incarnatum  
T. resupinatum  
T. meneghinianum  
30/9/60

1 sample each of Vicia alba,  
V. articulata, V. atro-  
purpurea, V. dasycarpa,  
V. ervilia and 3 samples of  
V. sativa sent from Head-  
quarters.

Seed requested from Rabat,  
Morocco.

30/9/60

So far two samples received  
and dispatched.

Seed requested from India,  
Israel and Ethiopia.  
6/10/60  
Following samples received:  
India: Niger (I.C.1900),  
Niger (commercial), Safflower  
(NP 1 and NP 30), Sesame  
E.C. 4605, E.C. 4606 and  
E.C. 7713).  
Israel: Castor (M.E. Rehovot,

Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
Professor of Botany Agricultural College and Research Institute Coimbatore India 4/10/60	Seed of forage species: <u>Dactylis glomerata</u> <u>D. glomerata hispanica</u> <u>Medicago sativa</u> <u>Onobrychis sativa</u> <u>Eragrostis curvula</u> (Ermelo strain) <u>Festuca elatior</u> (Bou Fichta strain Tunisia) <u>Festuca elatior</u> (Grombalia strain Tunisia) <u>Dactylis glomerata</u> var. <u>maritima</u>	Seed of all species sent from Headquarters. 30/10/60
Mr. S.T. Hoyle Department of Agriculture Nyasaland 8/10/60	Small seed samples of Linseed for trial purposes	Seed requested from Morocco and India. 10/11/60 Two samples received from Morocco (H4 and 196-21) and six from India: NP(R.R.)45, NP(R.R.)38, NP(R.R.)9, NP(R.R.)204, NP12 and NP124.
Monsieur F. Lecochee Sariapar Kandongan Research Station Haute Volta 18/10/60	Seed of open headed sorghums with a growth cycle of 130-155 days.	Seed requested from India 23/11/60 Two samples received of varieties Ubha Dhingra and Coimbatore 19.
Mrs. A. Riger Plant Introduction Officer Nve-Yaar Israel 18/10/60	Seed of <u>Festuca elatior</u> var. <u>arundinacea</u> No. 352 from Algeria	Seed requested from Algeria. 22/10/60 Seed received and dispatched.
Mr. C. During Department of Agriculture Wellington New Zealand 11/11/60	Seed samples of <u>Vicia</u> <u>sativa</u> , <u>V. villosa</u> , <u>V. sinensis</u> , <u>Trifolium</u> <u>alexandrinum</u>	Seed of 18 varieties of <u>V. sativa</u> ; 16 of <u>V. villosa</u> ; 1 of <u>V. sinensis</u> and 3 of <u>Trifolium alexandrinum</u> . Sent from Headquarters. 23/11/60
Dr. Panos Director, Hellenic Agricultural Research Station Larissa Greece 14/11/60	Seed of chickpeas, lentils and vetches from Tanganyika	Seed requested from Dept. of Agriculture, Dar-es- Salaam. 20/11/60 No seed received as yet.



<u>Country and Date of Receipt of Requests</u>	<u>Seed Requested</u>	<u>Date dealt with and Remarks</u>
Mr. P. Ryan Director of Agriculture Department of Agriculture Victoria Australia 21/11/60	Seed of 2 row early maturity drought resistant barleys.	Seed requested from Canada, USA, Argentina, Mexico, Iran and Turkey. 12/12/60 So far following material received: <u>Canada</u> : Vantage x Campana, Munsing x 46-103 (Titan x Smyrna), B 861 (ex USSR). <u>U.S.A.</u> : Campana, Dekap, Spartan, Otis and Munsing. <u>Iran</u> : Breeding material: 1-36-7023, 1-36-7043, 1-36-7062, 1-36-7164, 1-36-7166, 1-36-5272, 1-36-5289 and 1-36-5361.
Mr. John Roseweir University College of Wales, Aberystwyth 25/11/60	Samples of <u>Secale cereale</u> from as wide an area as possible.	List of contact addresses sent and two samples sent from Headquarters: <u>Secale cereale montanum</u> and <u>Secale cereale anatolum</u> 29/11/60
Ing. Agr. Alberto R. Leira Directeur de Cultures Industriales Buenos Aires Argentina 25/11/60	Seed samples of <u>Pyrethrum</u> ( <u>Chrysanthemum cinerariae-</u> <u>folium</u> )	Seed requested from Kenya, Japan and New Guinea 29/11/60 Samples so far received from Japan.
Mr. Ken Jones FAO Expert La Paz Bolivia 2/12/60	Seed samples of <u>Lolium</u> <u>rigidum</u> , <u>Trifolium</u> <u>subterraneum</u> var. Clare, <u>Medicago tribuloides</u> , <u>Onobrychis sativa</u>	Seed of Clare requested from Australia. Seed of following sent from Headquarters: <u>Medicago tribuloides</u> (ex Australia) <u>Onobrychis sativa</u> (ex Italy) <u>Lolium rigidum</u> (ex Australia) <u>Trifolium subterraneum</u> varieties Bacchus, Marsh, Tallarook, Mt. Barker. 5/12/60

Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
Mr. J. Grandval El Piquete Northern Argentina 6/12/60	Seed of the following forage species: <u>Vigna gracilis</u> <u>Teramnus labialis</u> <u>Teramnus repens</u> <u>Trifolium cherangeniensis</u> <u>Stylosanthes vojeri</u> <u>Alsicarpus vaginalis</u> var. <u>mummuralifolium</u> <u>Indigofera subulata</u> <u>Argyrolobium</u> <u>Vigna vexillata</u> <u>Dolichos</u> sp. ex Kitale <u>Rhynchosia elegans</u> <u>Arachis marginata</u> <u>Desmodium uncinatum</u> <u>Desmodium distortum</u> <u>Lotononis bainesii</u> <u>Alfalfa China</u> ex Congo <u>Cajanus cajan</u> <u>Adesmis bicolor</u> <u>Strophostyles vexillatus</u> <u>Phaseolus atropurpureus</u>	Seed requested from Thailand, Kenya, Costa Rica, Sudan, Jamaica, Queensland, Paraguay, Uruguay. 13/12/60 So far seed of <u>Vigna gracilis</u> , <u>Teramnus labialis</u> , <u>Teramnus</u> <u>repens</u> , <u>Trifolium cherangen-</u> <u>censis</u> , <u>Indigofera subulata</u> , <u>Dolichos falcatus</u> and <u>Dolichos</u> <u>biflorus</u> received from Kenya and seed of <u>Lotononis bainesii</u> and <u>Phaseolus atropurpureus</u> from Queensland, Australia.
Ministry of Agriculture Damascus Syria, U.A.R. 6/12/60	2 kilos samples of hybrid corn especially American hybrids.	Seed requested from U.S.A. 26/1/61
Mr. G.J. Piquer Regional Horticulturist Cairo, U.A.R. 6/12/60	Seed of <u>Duboisia myropoides</u> , <u>Datura insignis</u> and <u>Datura</u> <u>suaveolens</u> .	Seed requested from Australia and India. 15/12/60 So far <u>Duboisia myropoides</u> received from Australia.
Mr. R. Watson FAO Representative in Ethiopia Addis Ababa 12/12/60	Small seed samples of Castor, Rape, Groundnut and Sesame.	Seed requested from U.S.A., India, Germany, Morocco, Sudan. 14/12/60 No seed received as yet.
Dr. D.L. Barnes Grasslands Agricultural Research Station Southern Rhodesia 14/12/60	Seed of oats and vetches ( <u>V. sativa</u> and <u>V. villosa</u> ) suitable for growing at 5,400 ft with first in early dry season and with warm temperatures 85-90°F in late dry season. Soils sandy and sandy loams.	Seed requested from Cyprus, Greece, Sweden, Belgium, U.K. and Turkey. 16/12/60 So far the following samples received: Greece: <u>Vicia sativa</u> var. BI-45.



Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
	(Cont'd)	<p>U.K. (Scotland): Oat varieties Bell, Albyn Bard, Albyn Empress, Aa 725, Aa 732, Aa 737, Aa 738, Aa 739, Aa 741 and Aa 742.</p> <p>U.K. (Wales): S.147, Powys, Penrhyn and S.172.</p> <p>Belgium: <u>Vicia sativa</u> varieties S7-1, S7-2, S1.11-4 and S1.12-1.</p> <p>Sweden: <u>Vicia sativa</u> varieties Lerna and Star. Oat varieties Sun II, Blixt and Blenda.</p>
<p>Monsieur A. Barré Directeur Cooperative d'Utilisation de Matériel de Battage et de Préparation de Semences Le Plessis Belleville France 22/12/60</p>	<p>(a) Seed of the following wheat varieties: Saunders Mindum (old American variety) <u>Triticum macha</u> American, Australian and Japanese varieties resistant to <u>Oidium</u> and rust (especially <u>Puccinia graminis</u>).</p> <p>(b) Varieties of Teosinite for breeding with maize strains.</p> <p>(c) Varieties of sunflower.</p>	<p>Seed requested from Canada, U.S.A., U.S.S.R., Germany, Australia, Japan and Southern Rhodesia.</p> <p>31/1/61</p> <p>So far seed of <u>Triticum macha</u> received from Germany.</p>
<p>Dr. R. Stanton Regional Research Station Samaru Northern Nigeria 27/12/60</p>	<p>Seed of a wide range of material of <u>Phaseolus radiatus</u>, <u>Ph. aureus</u>, <u>Ph. mungo</u>, <u>Ph. acutifolius</u>, <u>Cicer arietinum</u>.</p>	<p>Seed requested from Greece, Egypt, India, Japan, Morocco and Surinam.</p> <p>22/2/61</p>
<p>Mr. B. Crombie Agricultural Institute Thurles, Co. Tipperary Ireland 28/12/60</p>	<p>Seed of the following forage species from Spain, France, Italy, Yugoslavia, Greece, Turkey and Israel: <u>Lolium perenne</u> <u>L. multiflorum</u> <u>L. rigidum</u> <u>L. italicum</u> <u>Festuca pratensis</u> <u>F. arundinacea</u> <u>F. elatior</u> <u>Dactylis glomerata</u> <u>D. aschersoniana</u> <u>D. hispanica</u> <u>D. woronowii</u> <u>D. maritima</u></p>	<p>Seed requested from all the countries listed</p> <p>20/1/61</p> <p>and the following material sent from headquarters: <u>Dactylis glomerata</u> FAO-2662. Spain FAO-2641. Italy <u>Festuca arundinacea</u> FAO-2124. Israel <u>Festuca elatior</u> FAO-1916. Portugal <u>Trifolium hirtum</u> FAO-2613. Cyprus <u>Trifolium pratense</u> FAO-2850. Italy</p>

Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
(Cont'd)	<u>Lotus corniculatus</u> <u>L. hispidus</u> <u>L. uliginosus</u> <u>L. tenuis</u> <u>Medicago falcata</u> <u>M. officinalis</u> <u>M. lupulina</u> <u>M. sativa</u> <u>M. arabica</u> <u>M. minima</u> <u>Melilotus alba</u> <u>M. officinalis</u> <u>M. suaveolens</u> <u>Phleum pratense</u> <u>P. nodosum</u> <u>P. alpinum</u> <u>Phalaris arundinacea</u> <u>Ph. bulbosa</u> <u>Ph. nodosa</u> <u>Ph. canariensis</u> <u>Ph. tuberosa</u> <u>Holcus lanatus</u> <u>H. mollis</u> <u>Alopecurus pratensis</u> <u>A. bulbosus</u> <u>A. geniculatus</u> <u>Trifolium repens</u> <u>T. pratense</u> <u>T. fragiferum</u> <u>T. ambiguum</u> <u>T. hirtum</u> <u>T. hybridum</u>	<u>Phleum pratense</u> FAO-2656. Italy <u>Lolium multiflorum</u> FAO-2125. Israel  Awaiting seed from other countries.
Monsieur le Directeur Institut de Recherches Agronomiques Tananarive Madagascar 28/12/60	Seed samples of <u>Derris</u> <u>elliptica</u> and <u>Lonchocarpus nicou</u>	Two contact addresses given in Brazil. 25/11/60
Mr. S.O. Fejer Grasslands Division Palmerston North New Zealand 29/12/60	Samples of <u>Dactylis</u> collected by Dr. Kuckuck in Iran in 1954 and sample of <u>Dactylis</u> <u>lusitanica</u> .	Seed of <u>D. lusitanica</u> requested from Portugal and 2 samples of <u>D. glomerata</u> available sent from head- quarters: FAO-3752 and FAO-3754. 27/2/61
Mr. J.M. Suttie Irrigation Research Station Embu Kenya 2/1/61	Seed of white rice of the <u>Indica</u> type with length breadth ratio of 3:1 or more	Requested more information on prevailing altitude and temperature conditions 26/1/61



Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
Mrs A. Riger Officer in Charge Plant Introduction Service Beit Dagan Israel	Seed of the following wheat leaf rust diffe- rentials: Malakof C.I. 4898 Hussar C.I. 4834 Democrat C.I. 3384 Mediterranean C.I. 3332 Carina C.I. 3756 Brevit C.I. 3778 Loros C.I. 3779 Webster C.I. 3780	Seed requested from Canada, Italy and the Netherlands. 27/1/60 Seed will be supplied from Kansas State University, U.S.A.
Prof. G. Haussmann Director, Lodi Experiment Station Lodi Italy 3/1/61	Seed of <u>Eragrostis curvula</u> varieties Ermelo, Groot- fontein and Witbark	Seed of last two varieties requested from South Africa 31/1/61 Seed received and dispatched with Ermelo from head- quarters.
Dr. Om. P. Kamra Atomic Energy Establishment Biology Division Bombay India 16/1/61	Seed of <u>Vicia</u> spp. Chillies, tomatoes, peas and other pulses.	Seed of following varieties dispatched from head- quarters: 30/1/61 <u>Phaseolus vulgaris</u> FAO-1677. Italy <u>Ph. lathyroides</u> FAO-2091. Sudan <u>Ph. aureus</u> FAO-376. Ceylon <u>Ph. radiatus</u> FAO-3887. Indonesia <u>Lycopersicon esculentum</u> FAO-4063. France <u>Pisum sativum</u> FAO-1941. Italy <u>Vicia sativa</u> FAO-6744. U.S.A. FAO-2086. Australia FAO-2965. Greece <u>Vicia sativa</u> sp. <u>aborata</u> FAO-2916. Portugal <u>Vicia ervilia</u> FAO-2057. Cyprus <u>Vicia atropurpurea</u> FAO-2071. Cyprus FAO-1933. Portugal <u>Vicia ervilia</u> FAO-2109. Algeria

Country and Date of  
Receipt of Requests

Seed Requested

Date dealt with and Remarks

Mr. E.A. Hollowell  
Legume Section  
USDA Beltsville  
U.S.A.  
19/1/61

$\frac{1}{2}$  kilo seed samples of  
Saidi and Khadrawi  
varieties of Berseem  
clover (Trifolium  
alexandrinum).

Seed requested from Egypt  
(U.A.R.)  
30/1/61

Mr. Pierce Ryan  
The Agricultural Institute  
Johnston Castle Agri-  
cultural College  
Wexford  
Ireland  
20/1/61

Seed samples of hemp  
(Cannabinus sativa)  
from Europe and  
Eastern countries.

Seed requested from France,  
Germany, India, Poland,  
Japan and Italy.  
1/2/61  
Still awaiting seed.

Mr. R.F. Dickinson  
Nickersons Seed Specialists  
and Plant Breeders  
Grimsby  
England  
27/1/61

4 lb. seed sample of the  
recombined American  
World Collection of  
barleys.

Seed requested from the  
University of California,  
Davis, U.S.A.  
1/2/61  
Seed being sent.

Dr. José Penha Garcia  
Chairman Portuguese  
National FAO Committee  
Lisbon  
Portugal  
27/1/61

Seed samples of  
Chrysanthemum cinerariae-  
folium

Seed requested from Japan  
1/2/61  
So far seed received from  
Japan.

Dr. J.S. Pate  
Department of Botany  
The Queens University  
Belfast  
N. Ireland  
30/1/61

Seed samples of:  
Trifolium campestre  
T. arvense  
T. glomeratum  
T. medium  
T. alexandrinum  
T. ambiguum

Seed requested from Spain,  
Switzerland and Germany.  
6/2/61  
Samples of T. campestre,  
T. arvense, T. glomeratum  
and T. alexandrinum received  
and dispatched.

Ing. Agr. E.C. Clos  
Chief of the Division of  
Exploration and  
Introduction of Plants  
Buenos Aires  
Argentina  
6/2/61

Seeds of the Tobacco  
variety Kentucky

Seed requested from Kentucky,  
U.S.A.  
10/2/61  
Still awaiting seed.

Dr. Takumi  
Tsuchiya  
Kihara Institute for  
Biological Research  
Japan  
7/2/61

Seed of following barley  
varieties:  
Beka - France  
Hafnia - Denmark  
Hunter - Ireland  
Ingrid - Sweden  
Pallas - Sweden  
Valla - Germany  
Pioneer - England  
Tschernaks )  
Zweizeilige } - Austria  
Wintergste )

Seed requested from respective  
countries.  
8/2/61  
So far seed of Beka, Pallas,  
Hunter, Ingrid Hafnia and  
Volla received.



Country and Date of Receipt of Requests	Seed Requested	Date dealt with and Remarks
Director of Agriculture Ministry of Agriculture Baghdad Iraq 21/2/61	Seed of the following cereal varieties: Wheat C 271) C 273) } Pakistan Dirk ) C 518) Wheat Senator ) Capelli ) } Libya Wheat Hourani F.8) Barley Arivat ) } Jordan	Seed requested from Pakistan, Libya and Jordan. 28/2/61
Dr. C. de Fellner R.W. Gunson (Seeds) Ltd. London England 22/2/61	Seed samples of upland and lowland jute.	Seed requested from India, Pakistan and Taiwan. 27/2/61
Dr. Ivor Isaac Botany Department University of Swansea Wales U.K. 24/2/61	Seed sample of <u>Sulla C</u> ( <u>Hedysarum coronarium</u> )	Seed sent from Headquarters 30/2/61
Mr. A. Abraham Plant Introduction Service Israel 27/2/61	Seed sample of <u>Argania</u> <u>sideroxylon</u> from North Africa (Morocco or Algeria).	Seed requested from North Africa. 28/2/61

170. United Kingdom: Plant collecting expedition in Eastern Turkey and Northern Iran

A small expedition was undertaken last summer by Rear-Admiral P. Furse and Mr. P.M. Syngé, Editor of the Royal Horticultural Society, to collect and study the plants, particularly the bulbous plants, of the mountains of Eastern Turkey and Northern Iran. The party made a large collection of bulbs and other plants which is now being grown at Wisley and from which material has already been distributed to several botanic and private gardens. The collection of herbarium material, about 950 numbers, has been presented to the Royal Botanic Garden, Kew. Many of the bulbs had finished flowering when collected and so their identification cannot be completed until they flower again in this country, but several interesting species of Tulipa, Crocus, Colchicum, Iris and Fritillaria were collected. Particularly interesting were the Oncocyclus irises seen and collected. Among the collections is a species of Lilium with tall stems and recurved Turk's-cap yellow flowers with maroon centres which may prove to be an undescribed species, or at least one new to cultivation in this country. The expedition from the time it left Ankara to its return there, covered just over 6,000 miles in two months and went as far east as Meshed, which is close to the Iranian-Afghan-Russian frontier.

(Journal of the Royal Horticultural Society, February 1961,  
Vol.LXXXVI, Part Two, pp.50-1)

171. Germany: Solanum species in South America

ROSS, H.\* 1960. Über die Zugehörigkeit der knollentragenden Solanum-Arten zu den pflanzengeographischen Formationen Südamerikas und damit verbundene Resistenzfragen. Zeitschrift für Pflanzenzüchtung, Vol. 43, No. 3, pp.217-240.

Author's summary

The relationship of the tuber bearing Solanum species to the plant geographical formations of South America and problems of resistance to disease.

(1) The tuber forming species of Solanum in South America are investigated as to their belonging to specific vegetation zones.

(2) Theories are advanced on the occurrence of resistance to disease, based on the relationship to individual vegetation zones, ecological conditions and distinct parasites.

(3) Species of the hygrophytic mountain forests and mist forests may be expected to be resistant to Phytophthora, Alternaria, Synchytrium and Erwinia phytophthora; species of the mesophile Valle and Sierra scrub may be resistant to vector transmitted viruses; species of the xerophile Valle and Sierra thorn bush formations may be expected to be resistant to Streptomyces, Spongospora and nematodes.

(4) Drought resistance is most marked in species of the last named group and frost resistance is most marked in the moist, dry and thorn "puna".

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\* Dr. H. Ross, Max-Planck-Institut, Köln-Vogelsang, Germany.



(5) The question of anthropo-zoological influence on the present distribution of individual plant communities is discussed.

(6) Influences caused by pasturing and forest clearance, which are certainly greater than was formerly believed, have impaired certain formations to a greater or less extent and also the Solanum species they contain, others on the other hand have been favoured.

(7) The making of settlements, fields, roads etc., creates habitats which suit Solanum species. Most of the species prefer open situations, are sensitive to intense shade and are weak competitors. There are no indications which suggest movement over great distances.

172. Tanganyika: Pasture Research Station, Kongwa

In the Record of Research Work 1958-59 of the Tanganyika Agricultural Corporation report on the Pasture Research Station, Kongwa, it is stated that the following species are kept for observation:-

<u>Alysicarpus glumaceus</u>	<u>Glycine javanica</u>
<u>Bothriochloa insculpta</u>	<u>Melinis minutiflora</u>
<u>Brachiaria brizantha</u>	<u>Panicum antidotale</u>
<u>B. soluta</u>	<u>P. makarikariensis</u>
<u>Cenchrus ciliaris</u>	<u>P. destum</u>
<u>C. setigerus</u>	<u>P. maximum</u>
<u>Chloris gayana</u>	<u>P. chlorochloa</u>
<u>Clitaria ternata</u>	<u>Pennisetum purpureum</u>
<u>Cynodon plectostachyon</u>	<u>Setaria sphacelata</u>
<u>Enteropogon macrostachyus</u>	<u>S. trinervia</u>
<u>Eragrostis spp.</u>	
<u>E. superba</u>	
<u>E. leymaniana</u>	

173. Israel: Plant distribution in the Middle East

Professor M. Zohary, Department of Botany, Hebrew University of Jerusalem, has just returned from a two-months trip to Iran, where he has been completing a comprehensive study of plant distribution in the Middle East, covering Egypt, Iran, Iraq, Israel, Jordan, Lebanon, Syria and Turkey. UNESCO made special contacts for Dr. Zohary in Iran in order to facilitate his expedition, and the Iranian Ministry of Agriculture was extremely helpful to Dr. Zohary in arranging many of his trips. He has carried out floristical and ecological investigations as well as surveys of vegetation and plant geographical analysis. He now intends to assemble all the material for publication.

(UNESCO Arid Zone Newsletter No.10, December 1960, pp.15-16)

174. Argentina: Introduction of Sorghum roxburghii var. hians

The following reference may be of interest to readers:-

ORBEA, J.R. 1959. Introducción a la Argentina, descripción y cultivo de Sorghum roxburghii var. hians Stapf. in Revista de la Facultad de Agronomía, Vol.XXXV, pp.79-113.

175. Australia: Studies on the origin, evolution and distribution of the Gramineae

HARTLEY, W. and SLATER, Christine. 1960. Studies on the origin, evolution and distribution of the Gramineae. III. The tribes of the subfamily Eragrostoideae. Australian Journal of Botany, Vol.8, No.3, pp.256-76.

Authors' summary

In further studies of grass distribution, maps are presented showing the world distribution of the Eragrosteae (sensu str.) and of the subfamily Eragrostoideae within which it is included. Both taxa show centres of high relative specific differentiation in inland Australia and in South West Africa, but in addition, the subfamily has centres of differentiation in the Sahara region, northern Mexico, and north-western India.

The centres of differentiation are all in regions of hot, arid climate near the tropics of Cancer and Capricorn. The close relationship between climate and distribution is most apparent in the case of the subfamily Eragrostoideae, species of which are relatively abundant in the grass flora of all arid regions with high winter temperatures and summer or non-seasonal rainfall incidence.

The distributions of most of the other tribes and subtribes which have been included in the Eragrostoideae show a similar relationship to climate. Some apparent exceptions to this are discussed, and it is shown that the geographical evidence supports conclusions from recent cytotaxonomic and anatomical studies that the taxa concerned should be removed from the subfamily.

The very wide distribution of the subfamily and of its constituent taxa, as well as the close relationship between the distribution pattern and climate, suggests that the subfamily is a very old one. Geographical and taxonomic evidence indicates that it may have originated in tropical or subtropical Africa at least as early as the Oligocene.

176. Australia: C.S.I.R.O., Division of Plant Industry.

The following publication has recently been received:-

Quarterly list of introductions No.60 (Inventory of plants introduced during the quarter ended 31st March 1960)

This Quarterly List records the plants brought into Australia by the Plant Introduction Section of the C.S.I.R.O. Division of Plant Industry. In addition to the number and name of the plant, and the country of origin, a short description of each species or variety is given, together with an indication of its distribution and natural habitat, and of its economical characteristics. It is hoped that the list will be useful to the scientific workers in various parts of Australia who collaborate with the Section in testing the plants introduced.



Accessions of special interest received during the period include a large range of soybean varieties (27082-96, 27185-88) for trial in Queensland, including varieties from regions of comparable latitude to Queensland, which generally give better results than other introductions. A large number of species of Atriplex (27163-70) were obtained from overseas, to be used in experimental work on the sodium requirements of plants; a further introduction of Vicia graminea (27180) will be used in antigen reactions for blood grouping. From the U.S.A. a collection of lima bean varieties (27277-89) was obtained for trial in Queensland and Victoria.

(Foreword by W. Hartley, Officer-in-Charge, Plant Introduction Section).

#### 177. South Pacific Commission

Early in May, Mr. J.W. Parham, Botanist with the Fiji Department of Agriculture and seconded to the Commission by the Administration of the Colony of Fiji for a period of six months as Plant Exploration and Introduction Officer, took up his duties with the Commission. In the scope of the Plant Collection and Introduction project, he has already visited several territories in the area, concentrating mainly on a preliminary survey of coconut "varieties" in some islands of the South Pacific, and on furthering the breadfruit varieties survey already undertaken a few years ago by the former Plant Introduction Officer, Dr. J. Barrau. Grasses and legumes as pasture plants in the territories visited were also studied.

Mr. Parham visited the territory of Papua and New Guinea from 22 May to 19 June 1960, and the Condominium of the New Hebrides from 28 June to 21 July 1960. He also made a short visit to the island of Rotuma in August of this year. At the present time he is visiting Tonga, Western and American Samoa, and it is hoped, transport permitting, that Mr. Parham will be able to visit Niue Island and the Cook Islands.

Whilst in the Territory of Papua and New Guinea, Mr. Parham arranged for the collection and shipment of seed nuts of interesting coconut varieties requested by several territories. Thus seed nuts from the Markham Valley and from Karkar Island in New Guinea have already been shipped to Fiji, and the British Solomon Islands Protectorate. French Polynesia has also received Markham Valley seed nuts and a consignment of Karkar Island nuts is awaiting shipment to that territory. Likewise, seed nuts from Rotuma Island have been shipped to the territory of Papua and New Guinea, British Solomon Islands Protectorate, French Polynesia and also to the Indian Central Coconut Research Institute and the Bureau of Plant Industry at Manila in the Philippines. One hundred of these nuts were also retained for the Department of Agriculture in Fiji.

Whilst in the British Solomon Islands Protectorate recently, the Executive Officer for Economic Development at the South Pacific Commission, Dr. J. Barrau, made very interesting and useful contacts with the staff of the coconut research scheme at Lever's Plantations in Yandina. Mr. A. Green, the Senior Coconut Agronomist there,



proposes soon to go to the Gilbert Islands for a coconut survey at the request of the Western Pacific High Commission. He has kindly accepted to collect for the South Pacific Commission seed nuts of a local coconut cultivar "TE NINIGAUN" yielding a very large number of nuts and therefore of possible value in coconut breeding programmes.

Mr. J.H.A. Coenen, Assistant Plant Introduction Officer, visited Netherlands New Guinea from 19 August to 30 September in order to contact several Agricultural and Forestry Stations and to carry out a survey of coconut palm and breadfruit tree varieties in that territory to complement the work at present being done in the South Pacific Commission area by Mr. J.W. Parham. He visited the Sentani Lake area, Merauke, in the southern part of Netherlands New Guinea; the Manokwari and Ransiki areas and the island of Japan.

Several varieties of breadfruit were collected around Lake Sentani and on the island of Japan; rootcuttings or suckers were sent to the Department of Agriculture in Western Samoa, where, following the generous invitation of the Government of that territory, it is intended to establish a central collection of breadfruit varieties for comparative trials, propagation and distribution of the best varieties. The Government of French Polynesia has already sent 18 of their best varieties to this centre.

The South Pacific Commission Plant Collection and Introduction Service continues to introduce, distribute, or organize exchange of plant material of economic value, and since the beginning of May of this year more than 115 species and varieties have been distributed to various territories by means of this service. This material included the following:-

<u>Araucaria augustifolia</u>	<u>Lactuca sativa</u>
<u>A. cookii</u>	<u>Lycopersicum esculentum</u>
<u>A. cunninghamii</u>	<u>Macadamia ternifolia</u>
<u>Artocarpus altilis</u> (30 different varieties)	<u>Mundulea suberosa</u>
<u>Axonopus compressus</u>	<u>Pachira aquatica</u>
<u>Capsicum spp.</u>	<u>Pennisetum purpureum</u>
<u>Citrus sinensis</u> vars.	<u>Phaseolus spp.</u>
<u>Coffea arabica</u> Ex USDA	<u>Pinus patula</u>
<u>Colocasia esculenta</u>	<u>Piper nigrum</u>
<u>Cucumis melo</u>	<u>Pometia pinnata</u>
<u>Cynodon dactylon</u>	<u>Salix humboldtiana</u>
<u>Cyphomandra betacea</u>	<u>Serianthes calycina</u>
<u>Desmodium canum</u>	<u>Solanum melongena</u>
<u>D. intortum</u>	<u>Sorghum alnum</u>
<u>D. sandwicense</u>	<u>Swietenia macrophylla</u>
<u>D. uncinatum</u>	<u>Tectona grandis</u>
<u>Dioscorea alata</u>	<u>Terminalia kaernbachii</u>
<u>Durio zibethinus</u>	<u>Theobroma cacao</u> (Amelonado)
<u>Erythrina indica</u>	<u>Tripsacum laxum</u>
<u>E. fusca</u>	<u>Vanilla spp.</u>
<u>Garcinia mangostana</u>	<u>Xanthosoma sagittifolium</u>
<u>Ischaemum indicum</u>	

(Extract from South Pacific Commission Plant Collection and Introduction Newsletter No.9, 31 October 1960. Address: Pentagon, Anse Vata, Noumea, New Caledonia)



178. Fiji: Plant material introduced

Plant Introduction List No.8 has just been received from the Department of Agriculture, Fiji. This contains the names of 91 new introductions from 44 different species.